UTILITY
PATENT APPLICATION
TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	35.C14856
First Named Inventor or Application Identifier	
HIDEO HONMA	
Express Mail Label No.	

APPLICATION ELEMENTS
See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO:

Commissioner for Patents
Box Patent Application
Washington, DC 20231

1. [X] Fee Transmittal Form
(Submit an original, and a duplicate for fee processing)

2. [ ] Applicant claims small entity status.
See 37 CFR 1 27

3. [X] Specification   *Total Pages* [21]

4. [X] Drawing(s) *(35 USC 113)*   *Total Sheets* [2]

5. [ ] Oath or Declaration   *Total Pages* [ ]

   a. [ ] Newly executed (original or copy)

   b. [ ] Copy from a prior application (37 CFR 1.63(d))
(for continuation/divisional with Box 17 completed)
[Note Box 6 below]

     i. [ ] __DELETION OF INVENTOR(S)__
Signed Statement attached deleting
inventor(s) named in the prior application, see
37 CFR 1.63(d)(2) and 1.33(b).

6. [X] Application Data Sheet. See 37 CFR 1.76

7. [ ] CD-ROM or CD-R in duplicate, large table or Computer
Program *(Appendix)*

8. [ ] Nucleotide and/or Amino Acid Sequence Submission
(if applicable, all necessary)

   a. [ ] Computer Readable Form (CRF)

   b Specification Sequence Listing on.

     I. [ ] CD-ROM or CD-R (2 copies); or

     ii [ ] paper

   c. [ ] Statements verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

9. [ ] Assignment Papers (cover sheet & document(s))

10. [ ] 37 CFR 3.73(b) Statement
(when there is an assignee)   [ ] Power of Attorney

11. [ ] English Translation Document *(if applicable)*

12. [ ] Information Disclosure
Statement (IDS)/PTO-1449   [ ] Copies of IDS Citations

13. [ ] Preliminary Amendment

14. [X] Return Receipt Postcard (MPEP 503)
(Should be specifically itemized)

15. [ ] Certified Copy of Priority Document(s)
(if foreign priority is claimed)

16 [ ] Other: _____
_____
_____

17. If a CONTINUING APPLICATION, *check appropriate box and supply the requisite information:*

[ ] Continuation   [ ] Divisional   [ ] Continuation-in-part (CIP)   of prior application No. ___/_____

Prior application information: Examiner _____   Group/Art Unit: _____

For CONTINUATION OR DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

18. CORRESPONDENCE ADDRESS

[X] Customer Number or Bar Code Label	05514 *(Insert Customer No. or Attach bar code label here)*	or [ ] Correspondence address below

NAME	
Address	

City		State		Zip Code	
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DC_MAIN 37568 v 1

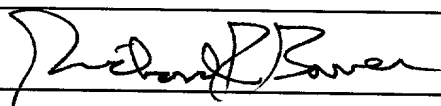| CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	TOTAL CLAIMS (37 CFR 1.16(c))	40-20 =	20	X $ 18.00 =	$ 360.00
	INDEPENDENT CLAIMS (37 CFR 1.16(b))	10-3 =	7	X $ 80.00 =	$ 560.00
	MULTIPLE DEPENDENT CLAIMS (if applicable) (37 CFR 1.16(d))			$270.00 =	$ 0.00
				BASIC FEE (37 CFR 1.16(a))	$ 710.00
				Total of above Calculations =	$ 1630.00
	Reduction by 50% for filing by small entity (Note 37 CFR 1.9, 1.27, 1.28).				
				TOTAL =	$ 1630.00

19. Small entity status

    a. ☐ A small entity statement is enclosed

    b. ☐ A small entity statement was filed in the prior nonprovisional application and such status is still proper and desired

    c. ☐ Is no longer claimed.

20. ☒ A check in the amount of $ __1630.00__ to cover the filing fee is enclosed.

21. ☐ A check in the amount of $ _____ to cover the recordal fee is enclosed.

22. The Commissioner is hereby authorized to credit overpayments or charge the following fees to Deposit Account No. 06-1205:

    a. ☒ Fees required under 37 CFR 1.16.

    b. ☐ Fees required under 37 CFR 1.17.

    c. ☐ Fees required under 37 CFR 1.18.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED	
NAME	Richard P. Bauer - Reg. No. 31,588
SIGNATURE	*[signature]*
DATE	October 3, 2000

RPB\cmv

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APPLICATION INFORMATION

Title Line One: OUTPUT CONTROL METHOD AND APPARATUS, AND STORAGE
Title Line Two: MEDIUM

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Formal Drawings?: Yes
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Secrecy Order in Parent Appl.?: No

REPRESENTATIVE INFORMATION

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PRIOR FOREIGN APPLICATIONS

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Filing Date: 10-06-1999
Country: JAPAN
Priority Claimed: Yes

OUTPUT CONTROL METHOD AND APPARATUS, AND STORAGE MEDIUM

BACKGROUND OF THE INVENTION

The present invention relates to an output control

5   method and an apparatus for controlling output of image

data imaged, for example, by a digital camera, and a

storage medium in which a control program for

controlling this output control apparatus is stored.

Generally, a television image may have a

10   resolution lower than that of a printed image, but it

must be displayed at a higher speed. Image data imaged

by a digital camera (digital camera data) has a

thumbnail image for such an application, and in some

cases, this thumbnail image is used as display data to

15   be displayed on a television receiver. That is, a

piece of image information includes main image data

having an original resolution and data of a thumbnail

image that is a thinned image thereof, and mainly, the

former is used as data to be printed and the latter is

20   used as data to be displayed on a television receiver

or the like.

In the above described thumbnail image, aspect

ratios are generally specified in a standard. However,

the aspect ratio of the above described main image is

25   not specified. In the case where the aspect ratios of

the above described main image and the above described

thumbnail image are different, for example, in the case

where a wide image is imaged, as shown in Fig. 3, an image in which a thinned image 302 of a main image is arranged in an external shape 301 with a specified aspect ratio is formed as a thumbnail image. Between the external shape 301 with the specified aspect ratio and the thinned image 302 of the main image, a black data (black frame) is put.

In the case where such a thumbnail image is used as data to be displayed on a television receiver or the like, when the whole of the thumbnail image is displayed as it is, there has been such a problem that the display image is not difficult to see since it is displayed together with the above described black data (black frame).

The present invention is made in view of such a problem included in the above described prior art, and it is an object of this invention to provide an output control method and an apparatus in which when outputting image data on the display on a television receiver or the like, even in the case where the aspect ratios of a thumbnail image and a main image are different, an image with the aspect ratio of the above described main image can properly be outputted on the display.

SUMMARY OF THE INVENTION

One embodiment of the present invention provides

an output control method for controlling output of image data imaged by image pick up means, comprising a display control step of displaying the above described image data on display means, wherein the above

5   described display control step compares the aspect ratios of a thumbnail image and a main image in the above described image data, and it performs the control so that the above described thumbnail image is used as display data to be displayed on the above described

10   display means when they are the same, and that the above described main image is used as the above described display data when they are different.

BRIEF DESCRIPTION OF THE DRAWINGS

15   Fig. 1 is a block diagram showing the configuration of a printer system having an output control apparatus (printer controller) according to one embodiment of the present invention;

        Fig. 2 is a block diagram showing the functional

20   configuration of the output control apparatus according to one embodiment of the present invention; and

        Fig. 3 is a conceptual diagram of a thumbnail image.

25   DESCRIPTION OF THE PREFERRED EMBODIMENTS

        One embodiment of the present invention will be described below by referring to drawings.

Fig. 1 is a block diagram showing the configuration of a printer system having an output control apparatus (printer controller) according to the present embodiment.

5   In the above described figure, reference numeral 101 denotes a digital camera that is image pick up means, and reference numeral 102 denotes a memory card, which keeps image data imaged by the digital camera 101 and can be removably attached to the above described

10   digital camera 101. Reference numeral 103 denotes a printer controller that is an output control apparatus of the present invention, which reads in the image data kept in the memory card 102 and controls the output of the read-in image data. Reference numeral 104 denotes

15   a television receiver (TV) as display means, which is made of a Cathode Ray Tube: CRT, a Liquid Crystal Display: LCD or the like, and is connected to the printer controller 103 to be controlled by the above described printer controller 103, and outputs the image

20   data on the display. Reference numeral 105 denotes a printer, which is connected to the printer controller 103, and is controlled by the above described printer controller 103 to outputs the image data on the printer.

25   The printer controller 103 has a slot into which the memory card 102 is inserted, and it displays the image data kept in the memory card 102 on the

television receiver 104 according to the operation of a
user, and in the meantime, it performs the control so
that the image data is outputted on the printer 105.
The image data from the digital camera 101 conforms to

5   a standard such as DCF, CIFF, Exif, and on the basis of
the specifications thereof, the printer controller 103
performs analysis and processing.

Fig. 2 is a block diagram showing an example of
the functional configuration of the printer controller

10   103.

As shown in the above described figure, the
printer controller 103 includes an operation control
part 201, a user interface control part 202, a control
panel 203, a memory card I/F (interface) 204, a file

15   system 205, image data analysis part 206, a TV display
control part 207, a TV display renderer 208, a printing
control part 209, and a printing renderer 210.

The TV display control part 207 is connected to
the TV 104, and the printing control part 209 is

20   connected to the printer 105.

Now, the operation of the printer controller 103
with the above described configuration will be
described.

The operation control part 201 performs the

25   integrated control according to the operation of the
user through the user interface control part 202 and
the control panel 203.   The user inserts a memory card

102 into the slot, and the image data analysis part 206 analyzes the image data through the memory card I/F 204 and the file system 205.

Then, in the case where the TV display is performed, the TV display control part 207 reads in display image data from the image data analysis part 206, and renders the display image data by the TV display renderer 208, and outputs it to the TV 104.

Furthermore, in the case where the printing is performed, the printing control part 209 reads in printing image data from the image data analysis part 206, and forms the printing image data by the printing renderer 210, and outputs it to the printer 105.

Now, the formation method of a display image data that is the essential point of the present invention will be described. First, the information on the aspect ratios of a thumbnail image and a main image is obtained from the image data analysis part 206, and these are compared with each other. Then, when they are the same, the thumbnail image is used as the display image data as it is, and when they are different, one of the following methods (1) to (3) is selected and performed:

(1) The main image is used as the display image data.

(2) The thumbnail image is subjected to a clipping process to have the aspect ratio of the main image. This process is performed such that for example, the

centers of the thumbnail image and the main image are matched to each other, and the upper and lower parts or the left and right parts of the thumbnail image are cut off so that it has the same aspect ratio as the main

5   image.

(3)   The clipping process method is determined from the information on the type of a digital camera 101 used for the imaging, and the clipping process is performed. For example, in the case where the aspect ratios of a

10   thumbnail image and a main image are different, there can be some cases where the centers of the thumbnail image and the main image are also different. In such cases, the actually imaged data position in the whole of the thumbnail image is determined from the

15   information on the type of the above described digital camera 101, and the clipping process is performed.

As described above in detail, according to the output control method and apparatus of the present invention, the aspect ratios of a thumbnail image and a

20   main image of image data are compared, and when they are the same, the thumbnail image is used as the display data, and when they are different, the main image is used as the display data, and consequently, an image faithful to the main image can be displayed.

25   Furthermore, according to the output control method and apparatus of the present invention, the aspect ratios of a thumbnail image and a main image of

image data are compared, and when they are the same, the thumbnail image is used as the display data, and when they are different, the thumbnail image is cut off to have the aspect ratio of the main image and is used

5   as the display data, and consequently, an image faithful to the main image can be displayed.

Furthermore, when the above described thumbnail image is cut off to have the aspect ratio of the main image, the information on the type of the image pick up

10   means is obtained, so that a position where the thumbnail image is cut off may be determined, and consequently, an effective image in the thumbnail image can surely be displayed.

Furthermore, according to the storage medium of

15   the present invention, the above described output control apparatus of the present invention can smoothly be controlled.

WHAT IS CLAIMED IS:

1.   An output control method for controlling output of image data imaged by image pick up means, comprising:

5   a display control step of displaying said image data on display means,

wherein the display control step compares aspect ratios of a thumbnail image and a main image in said image data, and performs control so that said thumbnail

10   image is used as display data to be displayed on said display means when the aspect ratios are the same, and that said main image is used as said display data when the aspect ratios are different.

15   2.   The output control method according to claim 1, wherein said image pick up means is a digital camera.

3.   The output control method according to claim

20   1, wherein said display means is a Cathode Ray Tube display.

4.   The output control method according to claim 1, wherein said display means is a Liquid Crystal

25   Display.

5.   The output control method according to claim

1, wherein said display means is a television receiver.

6. An output control apparatus for controlling output of image data imaged by image pick up means, comprising:

display control means for displaying said image data on display means,

wherein the display control means compares aspect ratios of a thumbnail image and a main image in said image data, and performs control so that said thumbnail image is used as display data to be displayed on said display means when the aspect ratios are the same, and that said main image is used as said display data when the aspect ratios are different.

7. The output control apparatus according to claim 6, wherein said image pick up means is a digital camera.

8. The output control apparatus according to claim 6, wherein said display means is a Cathode Ray Tube display.

9. The output control apparatus according to claim 6, wherein said display means is a Liquid Crystal Display.

10. The output control apparatus according to claim 6, wherein said display means is a television receiver.

5   11. An output control method for controlling output of image data imaged by image pick up means, comprising:

a display control step of displaying said image data on display means,

10   wherein the display control step compares aspect ratios of a thumbnail image and a main image in said image data, and performs control so that said thumbnail image is used as display data to be displayed on said display means when the aspect ratios are the same, and

15   that said thumbnail image is cut off to have the aspect ratio of said main image and used as said display data when the aspect ratios are different.

12. The output control method according to claim

20   11, wherein centers of said thumbnail image and said main image are matched when said thumbnail image is cut off to have the aspect ratio of said main image.

13. The output control method according to claim

25   11, wherein said display control step obtains information on types of said image pick up means and determines a position where said thumbnail image is cut

off when said thumbnail image is cut off to have the aspect ratio of said main image.

14. The output control method according to claim 11, wherein said image pick up means is a digital camera.

15. The output control method according to claim 11, wherein said display means is a Cathode Ray Tube display.

16. The output control method according to claim 11, wherein said display means is a Liquid Crystal Display.

17. The output control method according to claim 11, wherein said display means is a television receiver.

18. An output control apparatus for controlling output of image data imaged by image pick up means, comprising:

display control means for displaying said image data on display means,

wherein the display control means compares aspect ratios of a thumbnail image and a main image in said image data, and performs control so that said thumbnail

image is used as display data to be displayed on said display means when the aspect ratios are the same, and that said thumbnail image is cut off to have the aspect ratio of said main image and used as said display data

5   when the aspect ratios are different.

19.   The output control apparatus according to claim 18, wherein centers of said thumbnail image and said main image are matched when said thumbnail image

10   is cut off to have the aspect ratio of said main image.

20.   The output control apparatus according to claim 18, wherein said display control means obtains information on types of said image pick up means and

15   determines a position where said thumbnail image is cut off when said thumbnail image is cut off to have the aspect ratio of said main image.

21.   The output control apparatus according to

20   claim 18, wherein said image pick up means is a digital camera.

22.   The output control apparatus according to claim 18, wherein said display means is a Cathode Ray

25   Tube display.

23.   The output control apparatus according to

claim 18, wherein said display means is a Liquid Crystal Display.

24. The output control apparatus according to claim 18, wherein said display means is a television receiver.

25. An output control method for controlling output of image data imaged by image pick up means, comprising:

image data reading step of reading in said image data;

a display control step of displaying said image data read in said image data reading step on display means;

display data forming step of forming display data to be displayed on said display means according to an instruction of said display control step; and

display data outputting step of outputting display data formed in said display data forming step on said display means,

wherein the display control step compares aspect ratios of a thumbnail image and a main image in image data read in said image data reading step, and performs control so that said thumbnail image is used as display data to be displayed on said display means when the aspect ratios are the same, and that said main image is

used as said display data when the aspect ratios are different.

26. The output control method according to claim 25, wherein said image pick up means is a digital camera.

27. The output control method according to claim 25, wherein said display means is a Cathode Ray Tube display.

28. The output control method according to claim 25, wherein said display means is a Liquid Crystal Display.

29. The output control method according to claim 25, wherein said display means is a television receiver.

30. An output control apparatus for controlling output of image data imaged by image pick up means, comprising:

image data reading means for reading in said image data;

display control means for displaying said image data read in by said image data reading means on display means;

display data forming means for forming display
data to be displayed on said display means according to
an instruction of said display control means; and

display data outputting means for outputting

5   display data formed by said display data forming means
on said display means,

wherein the display control means compares aspect
ratios of a thumbnail image and a main image in said
image data read in by said image data reading means,

10   and performs control so that said thumbnail image is
used as display data to be displayed on said display
means when the aspect ratios are the same, and that
said thumbnail image is cut off to have the aspect
ratio of said main image and used as said display data

15   when the aspect ratios are different.

31.   The output control apparatus according to
claim 30, wherein centers of said thumbnail image and
said main image are matched when said thumbnail image

20   is cut off to have the aspect ratio of said main image.

32.   The output control apparatus according to
claim 30, wherein said display control means obtains
information on types of said image pick up means and

25   determines a position where said thumbnail image is cut
off when said thumbnail image is cut off to have the
aspect ratio of said main image.

33. The output control apparatus according to claim 30, wherein said image pick up means is a digital camera.

5   34. The output control apparatus according to claim 30, wherein said display means is a Cathode Ray Tube display.

35. The output control apparatus according to
10   claim 30, wherein said display means is a Liquid Crystal Display.

36. The output control apparatus according to claim 30, wherein said display means is a television
15   receiver.

37. A storage medium for storing a control program for controlling an output control apparatus that controls output of image data imaged by image pick
20   up means, which can be read by reading means,
         wherein the control program comprises a display control module for displaying said image data on display means, and said display control module compares aspect ratios of a thumbnail image and a main image in
25   said image data, and performs control so that said thumbnail image is used as display data to be displayed on said display means when the aspect ratios are the

same, and that said main image is used as said display data when the aspect ratios are different.

38. A storage medium for storing a control program for controlling an output control apparatus that controls output of image data imaged by image pick up means, which can be read by reading means,

wherein the control program comprises display control means for displaying said image data on display means, and said display control means compares aspect ratios of a thumbnail image and a main image in said image data, and performs control so that said thumbnail image is used as display data to be displayed on said display means when the aspect ratios are the same, and that said thumbnail image is cut off to have the aspect ratio of said main image and used as said display data when the aspect ratios are different.

39. A storage medium for storing a control program for controlling an output control apparatus that controls output of image data imaged by image pick up means, wherein the control program comprises:

image data reading module for reading in said image data;

a display control module for displaying said image data read in by said image data reading module on display means;

display data forming module for forming display
data to be displayed on said display means according to
an instruction of said display control module; and

display data outputting module for outputting

5   display data formed by said display data forming module
on said display means,

wherein the display control module compares aspect
ratios of a thumbnail image and a main image in image
data read in by said image data reading module, and

10   performs control so that said thumbnail image is used
as display data to be displayed on said display means
when the aspect ratios are the same, and that said main
image is used as said display data when the aspect
ratios are different.

15

40. A storage medium for storing a control
program for controlling an output control apparatus
that controls output of image data imaged by image pick
up means, wherein the control program comprises:

20   image data reading module for reading in said
image data;

a display control module for displaying said image
data read in by said image data reading module on
display means;

25   display data forming module for forming display
data to be displayed on said display means according to
an instruction of said display control module; and

display data outputting module for outputting
display data formed by said display data forming module
on said display means,

wherein the display control module compares aspect
5   ratios of a thumbnail image and a main image in said
image data read in by said image data reading module,
and performs control so that said thumbnail image is
used as display data to be displayed on said display
means when the aspect ratios are the same, and that
10   said thumbnail image is cut off to have the aspect
ratio of said main image and used as said display data
when the aspect ratios are different.

ABSTRACT OF THE DISCLOSURE

An output control method and an apparatus are provided, by which even in the case where aspect ratios of a thumbnail image and a main image are different, an
5   image with the aspect ratio of the main image can properly be displayed. The apparatus has a TV display control part for displaying image data imaged by a digital camera on a TV, and the TV display control part compares aspect ratios of a thumbnail image and a main
10   image in the image data, and performs control so that the thumbnail image is used as display data to be displayed on the TV when they are the same, and that the main image is used as the display data when they are different.
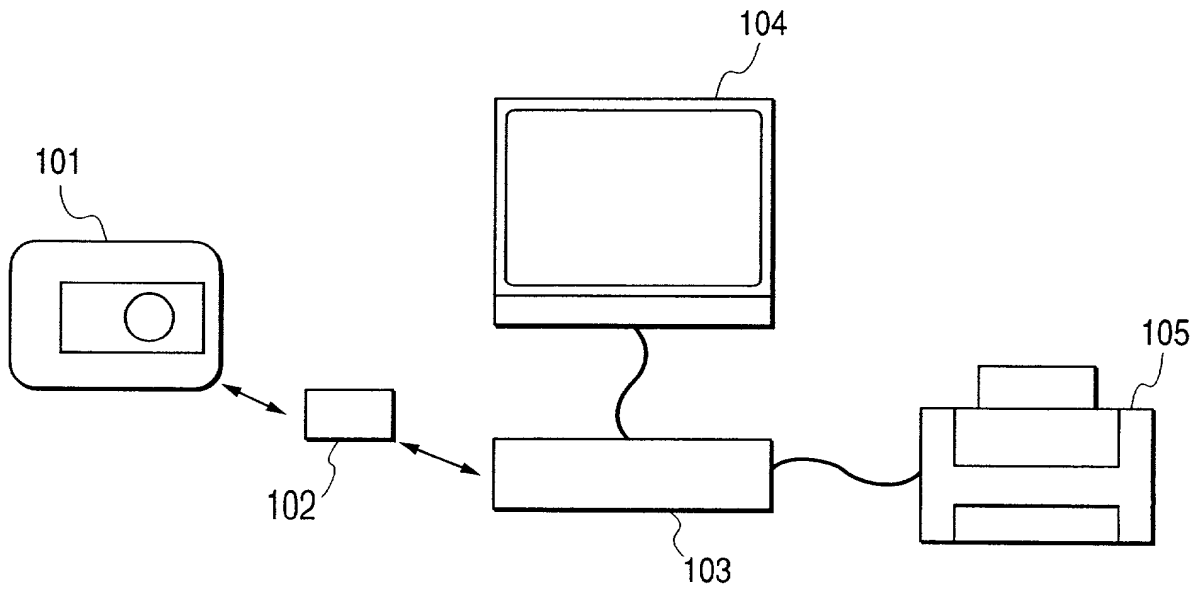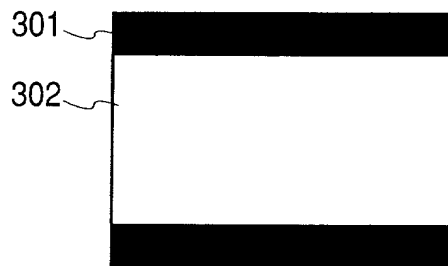
FIG. 1

FIG. 3

FIG. 2